

CLAIMS

What is claimed is:

1. A filter calibration circuit, comprising:
 - a comparator operable to generate a comparator output based on a filter output amplitude signal and a reference amplitude signal, the filter output amplitude signal corresponding to an amplitude of an output signal produced by a filter circuit that is to be calibrated to a desired frequency; and
 - a calibration logic unit operable to receive the comparator output and produce a component code to be used by the filter circuit in adjusting one or more component values in the filter circuit.
2. The filter calibration circuit of claim 1, further comprising:
 - an amplitude detector operable to receive the filter circuit output signal and generate the filter output amplitude signal based on an amplitude of the filter circuit output signal at the desired frequency.
3. The filter calibration circuit of claim 1, wherein:

the filter circuit includes an LC tank circuit.

4. The filter calibration circuit of claim 1, wherein:
the calibration logic unit includes a digital signal processor.
5. The filter calibration circuit of claim 4, wherein:
the digital signal processor includes the comparator.
6. The filter calibration circuit of claim 1, wherein:
the calibration logic unit includes a logic circuit.
7. The filter calibration circuit of claim 6, wherein:
the logic circuit includes the comparator.
8. The filter calibration circuit of claim 1, wherein:
the component code varies a capacitance in the filter circuit.
9. The filter calibration circuit of claim 8, wherein:
the capacitance varied is monolithically fabricated on a semiconductor substrate.

10. The filter calibration circuit of claim 8, wherein:
the component code varies the capacitance by controlling
a number of capacitive elements active in the filter circuit.
11. The filter calibration circuit of claim 1, further
comprising:
a digital-to-analog converter operable to receive a
digital reference amplitude code and produce the reference
amplitude signal.
12. The filter calibration circuit of claim 11, wherein:
the calibration logic unit is operable to produce the
digital reference amplitude code based on the comparator
output.
13. The filter calibration circuit of claim 1, further
comprising:
an analog-to-digital converter operable to receive the
filter output amplitude signal and produce a corresponding
digital amplitude code.

14. The filter calibration circuit of claim 13, wherein:
the comparator is operable to use the digital amplitude
code as the filter output amplitude signal and a stored
digital amplitude code as the reference amplitude signal.

15. The filter calibration circuit of claim 1, further
comprising:

a DC voltage source operable to produce the reference
amplitude signal; and

a variable-gain amplifier, the calibration logic unit
operable to vary a gain of the variable-gain amplifier based
on the comparator output.

16. The filter calibration circuit of claim 1, wherein:
the filter calibration circuit is operable to calibrate
the filter circuit to the desired frequency automatically when
the filter calibration circuit is connected to a power source.

17. The filter calibration circuit of claim 1, wherein:
the filter calibration circuit is operable to calibrate
the filter circuit to the desired frequency without requiring
a reduction in a quality factor of the filter circuit.

18. The filter calibration circuit of claim 1, wherein:
the filter calibration circuit is operable to calibrate
the filter circuit to the desired frequency without requiring
manual calibration of the filter circuit.

19. The filter calibration circuit of claim 1, wherein:
the filter calibration circuit is compliant with any of
IEEE standards 802.11, 802.11a, 802.11b, 802.11e, 802.11g,
802.11h, 802.11i, 802.11n, and 802.16.

20. A filter calibration circuit, comprising:
comparing means for generating a comparator output based
on a filter output amplitude signal and a reference amplitude
signal, the filter output amplitude signal corresponding to an
amplitude of an output signal produced by a filtering means
that is to be calibrated to a desired frequency; and
code generating means for receiving the comparator output
and producing a component code to be used by the filtering
means in adjusting one or more component values in the
filtering means.

21. The filter calibration circuit of claim 20, further comprising:

detecting means operable to receive the filtering means output signal, detect an amplitude of the filtering means output signal at the desired frequency, and generate the filter output amplitude signal based on the detected amplitude.

22. The filter calibration circuit of claim 20, wherein: the filtering means includes an LC tank circuit means.

23. The filter calibration circuit of claim 20, wherein: the code generating means includes a digital signal processing means.

24. The filter calibration circuit of claim 23, wherein: the digital signal processing means includes the comparing means.

25. The filter calibration circuit of claim 20, wherein: the code generating means includes a logic circuit means.

26. The filter calibration circuit of claim 25, wherein:
the logic circuit means includes the comparing means.
27. The filter calibration circuit of claim 20, wherein:
the component code varies a capacitance in the filtering means.
28. The filter calibration circuit of claim 27, wherein:
the capacitance varied is monolithically fabricated on a semiconductor substrate.
29. The filter calibration circuit of claim 27, wherein:
the component code varies the capacitance by controlling a number of capacitive means active in the filtering means.
30. The filter calibration circuit of claim 20, further comprising:
conversion means for receiving a digital reference amplitude code and producing the reference amplitude signal.
31. The filter calibration circuit of claim 30, wherein:
the code generating means is operable to produce the

digital reference amplitude code based on the comparator output.

32. The filter calibration circuit of claim 20, further comprising:

conversion means for receiving the filter output amplitude signal and producing a corresponding digital amplitude code.

33. The filter calibration circuit of claim 32, wherein:

the comparing means is operable to use the digital amplitude code as the filter output amplitude signal and a stored digital amplitude code as the reference amplitude signal.

34. The filter calibration circuit of claim 20, further comprising:

sourcing means for producing the reference amplitude signal; and

amplifying means, the code generating means operable to vary a gain of the amplifying means based on the comparator output.

35. The filter calibration circuit of claim 20, wherein:
the filter calibration circuit is operable to calibrate
the filtering means to the desired frequency automatically
when the filter calibration circuit is connected to a power
source means.
36. The filter calibration circuit of claim 20, wherein:
the filter calibration circuit is operable to calibrate
the filtering means to the desired frequency without requiring
a reduction in a quality factor of the filtering means.
37. The filter calibration circuit of claim 20, wherein:
the filter calibration circuit is operable to calibrate
the filtering means to the desired frequency without requiring
manual calibration of the filtering means.
38. The filter calibration circuit of claim 20, wherein:
the filter calibration circuit is compliant with any of
IEEE standards 802.11, 802.11a, 802.11b, 802.11e, 802.11g,
802.11h, 802.11i, 802.11n, and 802.16.

39. A method for calibrating a filter circuit, the filter circuit receiving an input signal and producing a filtered output signal, the method comprising:

generating a comparator output based on a filter output amplitude signal and a reference amplitude signal, the filter output amplitude signal corresponding to an amplitude of the filtered output signal at a desired frequency;

generating a component code based on the comparator output; and

adjusting one or more component values in the filter circuit based on the component code.

40. The method of claim 39, further comprising:

generating the filter output amplitude signal based on an amplitude of the filtered output signal at the desired frequency.

41. The method of claim 39, wherein:

generating the component code includes digitally generating the component code.

42. The method of claim 41, wherein:

generating the comparator output includes digitally generating the comparator output.

43. The method of claim 39, wherein:

adjusting one or more component values includes adjusting a capacitance in the filter circuit.

44. The method of claim 43, wherein:

adjusting a capacitance includes adjusting a capacitance monolithically fabricated on a semiconductor substrate.

45. The method of claim 43, wherein:

adjusting a capacitance includes controlling a number of capacitive elements active in the filter circuit.

46. The method of claim 39, further comprising:

producing the reference amplitude signal based on a digital reference amplitude code.

47. The method of claim 46, further comprising:

producing the digital reference amplitude code based on the comparator output.

48. The method of claim 39, further comprising:
 - producing a digital amplitude code based on the filter output amplitude signal.
49. The method of claim 48, further comprising:
 - using the digital amplitude code as the filter output amplitude signal; and
 - using a stored digital amplitude code as the reference amplitude signal.
50. The method of claim 39, further comprising:
 - producing a fixed DC reference amplitude signal; and
 - varying a gain based on the comparator output.
51. The method of claim 39, further comprising:
 - calibrating the filter circuit automatically when the filter circuit is connected to a power source.
52. The method of claim 39, further comprising:
 - calibrating the filter circuit without requiring a reduction in a quality factor of the filter circuit.

53. The method of claim 39, further comprising:
calibrating the filter circuit without requiring manual
calibration of the filter circuit.

54. The method of claim 39, wherein:
the method is compliant with any of IEEE standards
802.11, 802.11a, 802.11b, 802.11e, 802.11g, 802.11h, 802.11i,
802.11n, and 802.16.

55. A wireless transceiver, comprising:
a transmitter operable to transmit a modulated carrier
signal, the transmitter including a filter circuit operable to
filter the modulated carrier signal and a calibration circuit
operable to calibrate the filter circuit to a desired
frequency, the calibration circuit including,
a comparator operable to generate a comparator
output based on a filter output amplitude signal and a
reference amplitude signal, the filter output amplitude
signal corresponding to an amplitude of an output signal
produced by the filter circuit; and
a calibration logic unit operable to receive the

comparator output and produce a component code to be used by the filter circuit in adjusting one or more component values in the filter circuit.

56. The wireless transceiver of claim 55, wherein the calibration circuit includes:

an amplitude detector operable to receive the filter circuit output signal and generate the filter output amplitude signal based on an amplitude of the filter circuit output signal at the desired frequency.

57. The wireless transceiver of claim 55, wherein:

the filter circuit includes an LC tank circuit.

58. The wireless transceiver of claim 55, wherein:

the calibration logic unit includes a digital signal processor.

59. The wireless transceiver of claim 58, wherein:

the digital signal processor includes the comparator.

60. The wireless transceiver of claim 55, wherein:

the calibration logic unit includes a logic circuit.

61. The wireless transceiver of claim 60, wherein:

the logic circuit includes the comparator.

62. The wireless transceiver of claim 55, wherein:

the component code varies a capacitance in the filter circuit.

63. The wireless transceiver of claim 62, wherein:

the capacitance varied is monolithically fabricated on a semiconductor substrate.

64. The wireless transceiver of claim 62, wherein:

the component code varies the capacitance by controlling a number of capacitive elements active in the filter circuit.

65. The wireless transceiver of claim 55, wherein the

calibration circuit includes:

a digital-to-analog converter operable to receive a digital reference amplitude code and produce the reference amplitude signal.

66. The wireless transceiver of claim 65, wherein:
the calibration logic unit is operable to produce the
digital reference amplitude code based on the comparator
output.

67. The wireless transceiver of claim 55, wherein the
calibration circuit includes:
an analog-to-digital converter operable to receive the
filter output amplitude signal and produce a corresponding
digital amplitude code.

68. The wireless transceiver of claim 67, wherein:
the comparator is operable to use the digital amplitude
code as the filter output amplitude signal and a stored
digital amplitude code as the reference amplitude signal.

69. The wireless transceiver of claim 55, further comprising:
a DC voltage source operable to produce the reference
amplitude signal; and
a variable-gain amplifier, the calibration logic unit
operable to vary a gain of the variable-gain amplifier based

on the comparator output.

70. The wireless transceiver of claim 55, wherein:

the calibration circuit is operable to calibrate the filter circuit to the desired frequency automatically when the calibration circuit is connected to a power source.

71. The wireless transceiver of claim 55, wherein:

the calibration circuit is operable to calibrate the filter circuit to the desired frequency without requiring a reduction in a quality factor of the filter circuit.

72. The wireless transceiver of claim 55, wherein:

the calibration circuit is operable to calibrate the filter circuit to the desired frequency without requiring manual calibration of the filter circuit.

73. The wireless transceiver of claim 55, wherein:

the wireless transceiver is compliant with any of IEEE standards 802.11, 802.11a, 802.11b, 802.11e, 802.11g, 802.11h, 802.11i, 802.11n, and 802.16.

74. A wireless transceiver, comprising:

transmitting means for transmitting a modulated carrier signal, the transmitting means including a filtering means for filtering the modulated carrier signal and calibrating means for calibrating the filtering means to a desired frequency, the calibrating means including,

comparing means for generating a comparator output based on a filter output amplitude signal and a reference amplitude signal, the filter output amplitude signal corresponding to an amplitude of an output signal produced by the filtering means; and

code generating means for receiving the comparator output and producing a component code to be used by the filtering means in adjusting one or more component values in the filtering means.

75. The wireless transceiver of claim 74, wherein the calibrating means includes:

detecting means operable to receive the filtering means output signal, detect an amplitude of the filtering means output signal at the desired frequency, and generate the filter output amplitude signal based on the detected

amplitude.

76. The wireless transceiver of claim 74, wherein:
the filtering means includes an LC tank circuit means.
77. The wireless transceiver of claim 74, wherein:
the code generating means includes a digital signal processing means.
78. The wireless transceiver of claim 77, wherein:
the digital signal processing means includes the comparing means.
79. The wireless transceiver of claim 74, wherein:
the code generating means includes a logic circuit means.
80. The wireless transceiver of claim 79, wherein:
the logic circuit means includes the comparing means.
81. The wireless transceiver of claim 74, wherein:
the component code varies a capacitance in the filtering means.

82. The wireless transceiver of claim 81, wherein:
the capacitance varied is monolithically fabricated on a
semiconductor substrate.

83. The wireless transceiver of claim 81, wherein:
the component code varies the capacitance by controlling
a number of capacitive means active in the filtering means.

84. The wireless transceiver of claim 74, wherein the
calibrating means includes:
conversion means for receiving a digital reference
amplitude code and producing the reference amplitude signal.

85. The wireless transceiver of claim 84, wherein:
the code generating means is operable to produce the
digital reference amplitude code based on the comparator
output.

86. The wireless transceiver of claim 74, wherein the
calibrating means includes:
conversion means for receiving the filter output

amplitude signal and producing a corresponding digital amplitude code.

87. The wireless transceiver of claim 86, wherein:

the comparing means is operable to use the digital amplitude code as the filter output amplitude signal and a stored digital amplitude code as the reference amplitude signal.

88. The wireless transceiver of claim 74, further comprising:

sourcing means for producing the reference amplitude signal; and

amplifying means, the code generating means operable to vary a gain of the amplifying means based on the comparator output.

89. The wireless transceiver of claim 74, wherein:

the calibrating means is operable to calibrate the filtering means to the desired frequency automatically when the calibrating means is connected to a power source means.

90. The wireless transceiver of claim 74, wherein:

the calibrating means is operable to calibrate the filtering means to the desired frequency without requiring a reduction in a quality factor of the filtering means.

91. The wireless transceiver of claim 74, wherein:

the calibrating means is operable to calibrate the filtering means to the desired frequency without requiring manual calibration of the filtering means.

92. The wireless transceiver of claim 74, wherein:

the wireless transceiver is compliant with any of IEEE standards 802.11, 802.11a, 802.11b, 802.11e, 802.11g, 802.11h, 802.11i, 802.11n, and 802.16.